The Commonwealth of Massachusetts
Executive Office of Health and Human Services
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Bureau of Infectious Disease and Laboratory Sciences
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Clinical Advisory

TO: Massachusetts Health Care Providers

FROM: Larry Madoff, MD, Medical Director
John Bernardo, MD, Medical Director TB Program
Catherine M. Brown, DVM, MSc, MPH, State Epidemiologist

DATE: November 5, 2019

RE: Update on management and reporting of cases of unexplained e-cigarette or vaping-associated lung injury (EVALI) and request for certain clinical specimens

Key Points:
- Mandatory reporting of possible cases of EVALI remains in effect
- Updated clinical information on patient findings and management
- Request to obtain clinical specimens from case patients for CDC
- Request to obtain vaping materials from case patients for FDA

REPORTING:

Possible cases of unexplained e-cigarette or vaping-associated lung injury (EVALI) are reportable to the Massachusetts Department of Public Health (DPH) pursuant to 105 CMR 300.150. Healthcare providers should report any suspected cases to DPH using the PDF-fillable form and faxing it to the Department's confidential fax line at 617-983-6813. In addition, patient deaths related to EVALI should be reported to the Office of the Chief Medical Examiner.

For purposes of reporting, the case definition is unchanged: persons experiencing otherwise unexplained symptoms of shortness of breath, chest pain, cough, or GI or constitutional symptoms, and an abnormal chest imaging study, and with a history of vaping in the past 90 days.

As of October 30, 2019 DPH has reported 61 confirmed and probable cases, with two deaths. Weekly case counts are available on the DPH website.

CLINICAL GUIDANCE:

EVALI should be considered in clinically compatible patients with an appropriate history of vaping. An MMWR report published on October 11, 2019, entitled Update: Interim Guidance for Health Care Providers Evaluating and Caring for Patients with Suspected E-cigarette, or Vaping, Product Use Associated Lung Injury — United States, October 2019 contains recommendations based on current knowledge.

Almost all (95%) of patients have presented with respiratory symptoms including cough, chest pain, and shortness of breath. Many have also had gastrointestinal (GI) symptoms (abdominal pain, nausea, vomiting and diarrhea), sometimes preceding the respiratory symptoms. Respiratory and GI symptoms have frequently been accompanied by constitutional symptoms such as fever, chills, and weight loss. The most frequent physical findings have been tachycardia, tachypnea, and reduced SaO_2 on pulse oximetry. There are often no pulmonary findings on auscultation of the chest.

Clinically compatible patients should be asked about the use of e-cigarettes or vaping products and devices, including the type(s) of products and devices used and frequency of use. According to CDC, no single compound or ingredient has emerged as the cause of these injuries to date, and there might be more than one cause. Available data have not identified the specific chemical or chemicals responsible for EVALI. Both THC- and nicotine-containing products have been implicated as possible causes.

EVALI is considered a diagnosis of exclusion because, at present, no specific test or marker exists for its diagnosis. Health care providers should consider multiple etiologies, including the possibility of EVALI and concomitant infection. In addition, health care providers should evaluate alternative diagnoses as suggested by clinical findings and medical history.

Imaging studies should include a chest X-ray (CXR) on all suspect EVALI patients. Chest CT should be considered if CXR findings do not correlate with clinical history or to evaluate severe or worsening disease. Findings have included infiltrates on CXR and a variety of patterns on CT including ground-glass opacities (even with normal CXR). Findings are often bilateral and diffuse and have also included pneumothorax and pneumomediastinum.

Further workup and laboratory testing should be guided by clinical symptoms and signs. A respiratory viral panel is useful, since the most frequent alternative diagnosis is respiratory infection. As the rate of influenza infection is expected to rise in the coming weeks, influenza testing should be strongly considered. Other infectious workup, as for community acquired pneumonia, might include testing for *Legionella pneumophila*, *Streptococcus pneumonia* and *Mycoplasma pneumoniae*. Other infectious disease testing should be guided by individual patient risk factors. Other laboratory testing to be considered should include white blood cell count (WBC), inflammatory markers such as ESR and CRP, and hepatic transaminases. CDC has recommended consideration of urinary toxicology testing, including for THC, when clinically indicated. The decision about whether to perform invasive procedures, such as bronchoscopy or lung biopsy should be based on individual clinical circumstances.

Many patients have required hospitalization, however some with less severe injury may be considered for outpatient care if reliable follow-up in 24-48 hours can be assured. Management may require consultation with specialists such as Infectious Disease or Pulmonary. Corticosteroids may be helpful in treating this injury, and reports have described improvement that appears to be in response to such treatment. Since it is difficult to distinguish EVALI from community acquired pneumonia, antimicrobial therapy is often indicated.

CLINICAL SPECIMENS FOR TESTING:

In an effort to identify causes of EVALI, bronchoalveolar (BAL) fluid samples, with paired blood and urine specimens, if available, from patients with suspect EVALI who are considered to be

confirmed or probable cases, are requested for possible submission to CDC. Collection, processing, and retention of clinical specimens, including BAL fluid, blood, and urine for further analysis should follow guidance published by CDC: https://www.cdc.gov/tobacco/basic_information/e-cigarettes/pdfs/Lab-Clinical-Specimen-Collection-Storage-Guidance-Lung-Injury-508.pdf

Lung biopsy (obtained for clinical purposes) or autopsy specimens from patients with suspect EVALI who are considered to be confirmed or probable cases, are also a CDC priority. If obtained, lung biopsy specimens should be prepared with fixative for pathological examination. A fresh, unfixed specimen should be processed for lipid staining.

Please ask your laboratory retain these specimens at your facility and a DPH representative will contact you to arrange for submission to the Massachusetts State Public Health Laboratory (MA SPHL). Samples will be forwarded to CDC. Please do not send specimens to MA SPHL prior to being contacted and do not send specimens directly to CDC.

VAPING MATERIALS FOR TESTING:

The Food and Drug Administration is investigating vaping materials and equipment associated with confirmed and probable EVALI. If you identify a patient with possible EVALI, please ask them to retain any vaping material (including the apparatus and any partially used vaping materials). Patients considered to be confirmed or probable cases will be contacted by DPH to determine if product testing should occur and asked for their consent to be contacted by FDA.

Clinical questions may be addressed to John Bernardo, M.D. at john.bernardo@state.ma.us. Questions regarding reporting or specimens may be addressed to the DPH Epidemiology line at 617-983-6803.

ADDITIONAL RESOURCES:

CDC Website: Outbreak of Lung Injury Associated with the Use of E-Cigarette, or Vaping, Products
New England Journal of Medicine: E-Cigarettes and Vaping-Related Disease
FDA Website: Lung Illnesses Associated with Use of Vaping Products